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Research Article

Nutritional Status and Dietary Practices of Elderly People Living In Community Dwelling and Old Age Home In Tanahun District, Nepal

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Abstract:

Background: The main objective of the study was to access the nutritional status and dietary practice of elderly population living in community dwelling and old age home of Tanahun district, Nepal.

Methods: Community-based cross-sectional comparative study was conducted in Tanahun district. The Mini-Nutritional Assessment tool was used to investigate the nutritional status and dietary practices. It was identified by using weekly food consumption and 24 hours dietary recall questionnaires. Data were entered in Epi-Data (version 3.1) and analyzed by SPSS (version 20).

Result: Among 202 respondents (101 each from community dwellings and old age home), 44.5% were at risk of malnutrition, 5.9% were malnourished and 49.5% had normal nutrition status in community dwelling. Similarly, 55.4% were at risk of malnutrition, 17.8% were malnourished and 26.7% had normal nutrition status in old age home. In both settings, consumption of protein is low and consumption of vegetables is high. There was a significant association between socio-demographic variables such as living settings, age and education with nutritional status of elderly population. Age (AOR =0.0.186, p= 0.01) and education (AOR = 5.419, p= 0.006) shows significant association with nutritional status.

Conclusion: Overall half of them were at risk of malnutrition in both settings due to poor dietary practices, loss of appetite, weight loss, morbidity, neuropsychological problems among senior people. Cardinal focus should be given to improve the consumption of protein in dietary practices. Further longitudinal research studies should be conducted to determine factor associated with malnutrition to prevent malnutrition at regional and national level.

Keywords: Nutrition status, dietary practices, elderly people, Nepal

1. Introduction

Nutritional status is a key component that reduces morbidity and mortality among elderly and good nutritional status is the foundation of healthy life [1]. Good nutrition plays an imperative role in maintaining healthy & wellbeing life and delay the risk of developing diseases[2].

According to World Health Organization, in 2002 there were an estimated 605 million older persons in the world. Among them nearly 400 million of whom were living in low and middle-income countries. Elderly population age 60 years and above increased from 9.2% in 1990 to 11.7% in 2013 and projected to 21.1% by 2050, which may directly increase the elderly nutrition problems along with the health care and support services [3, 4]. Nepal as a low and middle-income country, population of elderly grew from 2.4 million in 2016 and projected to 3 million in 2026 and 3.4 million in 2031[5]. Malnutrition is an imperative syndrome in the elderly and leads to inadequate nutritional status and undernourishment characterized by dietary practices, poverty, illiteracy, inequality, food insecurity and lack of access to health services [6]. In Nepal poverty, government social security benefits encompass with lack of knowledge about the nutrition omnipresent vulnerability of the elderly malnutrition [7]. The Mini-Nutritional Assessment (MNA) is a validated nutritional screening and assessment tool developed for elderly patients in the United States and Europe. This tool is widely valid and has been used specifically developed to evaluate the nutritional status of elderly who are malnourished or at risk of malnutrition[8].

Malnutrition in the elderly is a factorial problem where dietary habits influence the nutritional status[9]. Especially changing dietary modification is often difficult among elderly because dietary habits are deeply rooted in the lives and culture of elderly which reduces the number of nutrition intake with the age[10]. Semi structure interview schedule was use as a tool in identifying dietary practice using weekly food consumption questionnaire and twenty-four hour dietary recall questionnaires. [11, 12].

According to World Health Organization (WHO) estimates, 1 in 6 persons globally were affected by malnutrition in 2015 [7]. Balanced diet in the elderly can improve nutritional status [9]. The prevalence of malnutrition in the UK has been reported that 93% of malnourished live in community dwelling and 5% malnourished live in old age institutions

[13]. Similarly, in India the risk of malnutrition among elderly living in community dwellings is 90% and those who live in old age homes is 73% [14]. Till now, the information regarding the nutritional status and dietary practice of elderly population living in community dwelling and old age home is minimal, while some studies conducted showed only the prevalence of malnutrition which is 31% in community dwelling [6] and 15.5% in old age home [15]. As a result, this study was designed to assess the nutritional status and dietary practices of elderly population living in both setting in Tanahun district, and to identify the association between nutritional status and dietary practices among elderly population.

2. Methods

2.1 Study designed and Setting:

Community based cross-sectional comparative study was conducted in Tanahun district, Nepal. Tanahun district lies in hilly region of Nepal. Limited studies had been conducted in this area and little significance was given to elderly population, nutrition and dietary practices.

2.2 Study population and sampling:

The elderly population age 60 years and above in Tanahun district with total sample size 202 was taken, where sample were equally distributed into community dwelling and old age home[16]. Using simple random sampling technique, the prevalence of malnutrition among elderly population was 15.5% in the similar study settings [15] with an error of 5% and 95% confidence limit. At the first stage, rural municipalities were taken from District Administrative Office. Myagde rural municipality was selected by lottery method. Among the local level three wards were taken in rural municipality randomly. Centre of each ward was identified with the help of Google Maps version 9.73.3. The first household was selected by spinning ball pen in the direction shown by the tip of the ball pen. From the selected house each sample were taken making a round and skipped the household where our sample were not available[17]. From each house only one eligible participant above 60 years were included while temporary resident (less than six months) was excluded in this study.

At second stage listing of old age home was taken from District Administrative Office using sampling frame strategy. Sample were collected from old age home listed in sampling frame by simple random sampling technique. Sample were collected until sample size were fulfilled. From each old age home participant above 60 years were included while temporary residents (less than six months) were excluded in this study.

2.3 Study Tools and Data Collection:

The Mini-Nutritional Assessment (MNA) tool[8] developed by the Nestle Nutritional was adapted to measure nutritional status. Questionnaires were filled to identify dietary practices[11, 12]. Tools were translated in Nepali language. Pretest was done among 10% of the sample in Kaski district in both settings (old age home and community dwelling) matching the eligible criteria and flaws were omitted. To ensure validity of the study, tool was developed by consulting with experts and doing extensive literature review. A face-to-face interview with the participants were conducted.

2.4 Study variables

2.4.1 Dependent Variables:

The nutritional status is categorized between three groups according to the coverage score in the MNA screening tool. Nutritional status assessment was performed using the MNA tool with 18 questions, which consist of anthropometric assessment: height and weight (BMI) or calf circumference; general assessment: lifestyle, medication and mobility; dietary assessment: food and fluid intake, autonomy of feeding and number of meals; and subjective assessment: self-perception about the health and nutrition. The nutrition status score was categorized as follows: elderly with scores 0-7 were considered as malnourished; elderly with scores 8-11 were considered as at risk of malnutrition; and elderly with score 12-14 were considered as having normal nutritional status[8].

Dietary practice was measured using questionnaire with 11 questions incorporate, weekly food intake: food items, number of days per week and frequency. Twenty-four hours dietary intake: at breakfast, meal lunch, snacks and meal dinner. Food code were used based on energy giving food, body building food and protective food.

2.4.2 Independent Variables:

Attributes such as demographic factor (age, sex, marital status, ethnicity and religion), socioeconomic status (literacy, illiterate, past occupation) and dietary practices (weekly food intake and 24 hours dietary recall).

2.5 Statistical Analysis:

The data were primarily entered in Epi data version 3.1 and analysed using SPSS (version 20). Data were summarized in terms of frequency (percentage), mean (SD) or median (IQR). Dependent variable was categorical. So, associations were tested using Pearson chi-square test taking 95% confidence interval.

2.6 Ethical Considerations:

The Institutional Review Committee of Pokhara University (Reg.no 62-075-076) approved this study. The permission was taken from District Administrative Office and Health Office, Tanahun. The participants were informed about the objectives of the study and participants were voluntary. Confidentiality was maintained, where written consent was taken from each respondent prior to data collection.

3. Results:

Based on the collected data, the results were interpreted considering objectives and were presented below. The results were divided into various heading. They were as follows: -

3.1 Socio-demographic Characteristics:

Table 1 Socio-demographic characteristics

Characteristics	Frequency(n)	Percentage (%)
Age in years (n=202)		
60-69	80	39.6
70-79	64	31.7
80 and above	58	28.7
Mean=73.70yrs, SD= 8.774, Minimum= 60 years, Maximum= 100 years		

Sex(n=202)		
Female	105	52
Male	97	48
Family Type (n=101 community dwelling only)		
Nuclear	23	22.78
Joint	78	77.22
Religion(n=202)		
Hindu	201	99.5
Buddhist	1	0.5
Ethnicity(n=202)		
Upper Caste	162	80.2
Disadvantage Janajati	10	5
Relatively advantaged Janajati	25	12.4
Dalit	5	2.5
Marital Status(n=202)		
Unmarried	19	9.4
Married	96	47.5
Widowed/widower	87	43.1
Education(n=202)		
Illiterate	88	43.6
Non formal education	64	31.7
Basic education	22	10.9
Secondary level	20	9.9
Graduate	6	3
Post graduate and above	2	1
Previous Occupation(n=202)		
Unemployment	11	5.4
Services	44	21.8
Business	6	3.0
Agriculture	141	69.8

Table 1 shows the socio-demographic characteristics of the participants. Among the 202 participants, 39.6% were between 60 and 69 years of age while 31.7% were between 70 and 79 year of age and 28.7% were 80 and above of age with mean age 70.73 years. Almost all of the participants were Hindu (99.5%) while those who were upper caste by ethnicity were 80.2%.Nearly half (47.5%) were married, followed by widowed/widower (43.11%) and Unmarried (9.4%). Among all, 43.6% were illiterate, 31.7% with non-formal education, while 3% had a graduate and interesting with 1% had postgraduate and above level. About 69.8% of the participants previously worked in the agriculture sector, followed by 21.8% doing services, 3% doing business and 5.4% were unemployed (Table 1).

3.2 Behavior related status

Table 2: Behaviour related status

Characteristics	Frequency(n)	Percentage (%)
Habit of Smoking (n=202)		
Never	194	96%
Ever	8	4%
Habit of Alcohol (n=202)		
Never	194	96%
Ever	8	4%

Table 2 shows behavioral characteristic of elderly people living in old age home and community dwelling where 96% each never had a smoking and habit of alcohol.

3.3 Nutritional Status of the Participants:

Nutritional status assessment was performed by using MNA scale with seven questions, which included anthropometric assessment and general assessment. In comparing nutritional status of the old age home, more than half (55.6%) participants were at risk of malnutrition, more than one-fourth (26.7%) has normal nutritional status and less than one-fifth (17.8%) were malnourished. Similarly, in community dwellings 44.6% participants were at risk of malnutrition. 49.5% had a normal nutrition and 5.9% were malnourished.

3.4 Weekly dietary characters

Weekly recall of dietary habit was carried among 202 participants. The participants were equally categorized according to their living settings (old age home and community dwelling). Among dietary characteristic, 17.8% in old age home respondents had eaten meat whereas 23.7% in community dwelling respondents had taken meat. In old age home only 1% respondents had eaten eggs while 12.8% respondents of community dwelling had taken eggs. In both settings 100% participants had taken vegetables. Similarly, 88% of the old age home and 89% respondent of community dwellings had eaten legume. Nearly cent percent (99%) participant of old age home respondents and 95.1% in community dwelling consume fruit products. About 86.1% in old age home consumed milk and 82.1% in community dwelling consumed milk. However, consumption of vegetables, legume, fruits and milk was significantly high in both old age home and community (Table 3). Sweet and Junk food was not preferred much by the old population.

Table 3: Weekly dietary characters

Characteristics	**Frequency (%)**	
	Old age home n=(101)	**Community dwelling n=(101)**
Meat (n=202)		
Yes	18 (17.8%)	24 (23.7%)
No	83 (82.2%)	77 (76.3%)
Meat per week		
< 3 days	16 (88.9%)	19 (79.1%)
≥ 3 days	2 (11.1%)	5 (20.9%)
Egg (n=202)		
Yes	1 (1%)	13(12.8%)
No	100 (99%)	88 (87.2%)
Egg per week		
< 3 days	1 (100%)	10 (76.9%)
≥ 3 days	0(0%)	3 (23.1%)
Vegetables (n=202)		
Yes	101 (100%)	101(100%)
Vegetable per week		
< 3 days	1 (1%)	5 (5%)
≥ 3 days	100(99%)	96 (95%)
Legume (n=202)		
Yes	89 (88.1%)	90(89.1%)
No	12 (11.9%)	11 (10.9%)
Legume per week		
< 3 days	19 (21.3%)	25 (27.8%)
≥ 3 days	70(78.7%)	65 (72.2%)
Fruits (n=202)		
Yes	100 (99%)	96 (95.1%)
No	1 (1%)	5 (4.9%)
Fruits per week		
< 3 days	14 (14%)	30 (31.2%)
≥ 3 days	86 (86%)	66 (68.8%)
Milk (n=202)		
Yes	87 (86.1%)	83 (82.1%)
No	14 (13.9%)	18(17.9%)
Milk per week		
< 3 days	12 (13.8%)	9 (10.8%)
≥ 3 days	75 (86.2%)	74 (89.2%)
Sweets (n=202)		
Yes	3 (2.9%)	11 (10.8%)
No	98 (97.1%)	90 (89.2%)
Sweets per week		
< 3 days	1 (33.3%)	7 (63.6%)
≥ 3 days	2 (66.7%)	4 (36.4%)
Junk food (n=202)		
Yes	4 (3.9%)	18 (17.8%)
No	97 (96.1%)	83 (82.2%)

Junk food per week		
< 3 days	3 (75%)	7 (38.9%)
≥ 3 days	1 (25%)	61.1%)

3.5 Twenty-four-hour Dietary recall:

Twenty-four-hour dietary recall was carried among old age home and community dwelling and characterized as breakfast, lunch, snacks and dinner.

3.5.1 Breakfast:

Among total respondents (65) in old age who had taken breakfast, majority 63(96.9%) took energy giving food. Similarly, among 82 total respondents in community dwelling majority 96.3% (79) had taken energy giving food.

3.5.2 Lunch:

Among 101 respondents taking lunch at old age home, almost all 99% (100) had taken energy gives food, 88.1% (89) had taken body building and 96% (97) had taken protective food. Likewise, among 100 respondent who had taken lunch at community dwelling, almost all 99% (99) had taken energy giving food while 88% (88) had taken body building food and 95% (95) took protective food.

3.5.3 Snacks:

Among 46 respondents in old age home majority 97.8% (45) had consumed energy giving food and among 73 respondents in community dwelling largely 97.3% (71) had taken energy giving foods.

3.5.4 Dinner:

Among 100 respondents who take dinner in old age home, 99% (99) intake energy giving food, 89% (89) takes body building food and 97% (97) takes protective food. Similarly, among 101 respondents who take dinner in community dwelling 100% takes energy giving food, 73.3% (74) takes body building food and 93.1% (94) takes protective food.

3.6 Association of socio-demographic variables with nutritional status

Table 4: Association between socio demographic variables and nutritional status

Variables	Nutritional Status		Chi Square	P-value
	Normal/At Risk	Malnourished		
Living Setting				
Old age home	83 (82.2%)	18 (17.8%)	**6.809**	**0.009***
Community Setting	95 (94.1%)	6 (5.9%)		
Age				
>73 years	94 (96.9%)	3 (3.1%)	**13.676**	**0.001***
≤73years	84 (80%)	21 (20%)		
Sex				
Male	89(91.8%)	8(8.2%)	2.345	.135
Female	89(84.8%)	16(15.2%)		
Family type (n=101)				
Nuclear	22(95.7%)	1(4.3%)	0.135	1
Joint	73(93.6%)	5(6.4%)		
Ethnicity				
Other caste	37 (92.5%)	3 (7.5%)	0.914[#]	0.424
Upper caste	141(87%))	21 (13%)		
Education				
Literate	110 (96.5%)	4 (3.5%)	**17.521**	**0.001***
Illiterate	68 (77.3%)	20 (22.7%)		

([#]Fishers exact value) (*significant at p>0.05)

Table 4 shows the association between socio demographic variables and nutritional status. Living settings (χ^2=14.068, p-value0.001), age (χ^2=16.378, p-value 0.001) and education (χ^2=31.871, p-value 0.001) were associated significantly with the nutritional status as among the study population.

3.7 Dietary practice and nutritional status:

Table 5: Association between dietary practices and nutritional status

Nutritional status Characteristics	Normal /At risk (%)	Malnourished (%)	Chi-Square	P – value
Meat				
Yes	40 (95.2%)	2 (4.8%)	2.567[#]	0.177
No	138 (86.2%)	22 (13.8%)		

Egg				
Yes	13 (92.9%)	1 (7.1%)	0.323[#]	1
No	138 (86.2%)	22 (13.8%)		
Legume				
Yes	160 (89.4%)	19 (10.6%)	2.409[#]	0.162
No	18 (17.3%)	5 (21.7%)		
Fruits				
Yes	12 (88.3%)	23 (11.7%)	0.135[#]	0.537
No	5 (83.3%)	1 (16.7%)		
Milk				
Yes	152 (89.4%)	18 (10.6%)	1.714	0.230
No	26 (81.2%)	6 (18.8%)		
Sweets				
Yes	14(100%)	0(%)	2.028[#]	0.382
No	164(87.2%)	24(100%)		
Junk food				
Yes	21(95.5%)	1(4.5%)	1.269[#]	0.483
No	157(87.2%)	23(12.8%		

([#]Fishers exact value) (*significant at p>0.05)

Table 5 shows the Association between dietary practices and nutritional status**.** No any variables were seen to be significant between dietary practices and nutritional status.

Association of explanatory variables with Nutritional status

Table 6: Association of explanatory variables with Nutritional status

Explanatory variable	Unadjusted OR	(95% CI)	P value	Adjusted OR	(95% CI)	P value
Living setting						
Old age home	3.434	**1.302-9.056**	**0.013***	1.421	0.477-4.227	0.528
Community Settings			**Ref**			Ref
Age						
>73 years	0.128	**0.037-0.443**	**0.001***	0.186	0.051-0.671	**0.01***
≤73years			**Ref**			Ref
Education						
Illiterate	8.08	**2.652-24.673**	**<0.001***	5.419	1.643-17.967	**0.006***
Literate			**Ref**			Ref

Table 6 shows the association of explanatory variables with nutritional status. Age (AOR =0.0.186, p= 0.01) and education (AOR = 5.419, p= 0.006) shows the significant association with nutritional status. Nearly two out of ten participants below age 73 years have chance of malnutrition while 8 participants above 73 years have chance of malnutrition. Similarly, the chance of malnutrition is 5.4 times more to the illiterate than literate people.

4 Discussion:

This study revealed that the elderly people living in Tanahun district in community dwelling 49.5% had normal nutritional status and in old age home 26.7% had normal nutritional status according to their MNA score. Rigorous discussion helps the finalization of the research findings.

Age was significantly associated with nutritional status, which states that nutritional status decreases with increasing age. Similarly, living setting and educational status were associated with nutritional status. In cases of dietary practice, both settings had 100% consumption of vegetables while consumption of meat was 17.8% in old age home and 23.7% in community dwelling.

Nearly half of the elders (44.6%) were at risk of malnutrition in community dwelling which was nearly similar to the finding from the study conducted in Nuwakot district of Nepal[7]. More than half (55.4%) were risk of malnutrition in old age home in our study which is the similar risk of malnutrition in old age home in the study from Pune, India [15]. In the present study, percentage of malnutrition in old age home was 17.8% which was nearly similar to the finding of the study conducted in Kathmandu, Nepal [15]. Likewise, present study shows 5.9% were malnourished which is differ with the study conducted in Nuwakot [7].

Socio-demographic factors such as setting, age and education were significantly associated with nutritional status. In the present study, age was seen to be significantly associated with nutritional status, which is similar to the study conducted in Nepal [7], India[18, 19], and Bangladesh[20]. Education level in Nepal [7], India [21], Finland [22] and Scotland[2] influenced the nutritional knowledge of elderly population that affected on nutritional status. However, the study shows no association of nutritional status with ethnicity which was shown by the study conducted in Nuwakot, Nepal[7]. This may be due to the presence of a greater number of people from same caste group.

In the present study the prevalence of malnutrition was 5.9% in community dwelling and (17.8%) in old age home. The prevalence of malnutrition in community dwelling is similar while prevalence of malnutrition was lower in old age home

in the study done in Mangalore city, India[14]. The study conducted by National diet and Nutrition among community dwelling and old age home in UK reported that the prevalence of malnutrition was 93% in community dwelling which was differ from our present study. The prevalence of malnutrition in old age home was 5% which was less than this study[13]. According to the study from Kathmandu, advancing in age there is risk of malnutrition among the elderly population living in old age home which seems to be worsening [15].

Weekly dietary characters and twenty-four-hour dietary recall in this study found that diversity in diet of elderly population was associated with prolonged longevity and improved health status which is similar to the study from Sri-Lanka [11]. This study reveals that (90%) intakes energy giving food on breakfast, lunch, snacks and dinner which was higher than finding of related study conducted in Sri-Lanka [11]. Alike study conducted on Sri-Lanka states that consumption of meat is less which was higher our study[11]. In our present study, majority had more consumption of fruits and vegetables than the research conducted in Sri-Lanka [11] and United States [23]. In the study from New Zealand, the consumption of vegetable is less (76-87%) than our current study. As similar, elderly people in New Zealand mostly consumed milk and milk product. It was 86.1% in old age home and 82.1% in community dwellings which is similar to our findings [24].

5 Conclusion:

The study showed that least participants were malnourished living in community dwelling than old age home. In addition, one-fourth of the participants living in old age home had malnutrition where more than half of them were at the risk of malnutrition. Majority of elderly people living in both settings were vegetarian and there was very less consumption of meat and egg. Among the elderly people living in both settings, vegetable consumption was found good. Consumption of legume in both settings was satisfactory. Similarly, consumption of fruit and milk was also satisfactory. Nutritional status was seen to be significantly associated with participants living settings, age and education. However, this study found no significant association between nutritional status and dietary practices of senior people living in both settings.

This study strongly recommends for the assessments of elderly nutritional status in old age home and community dwelling which helps to detect the malnutrition at an early stage and malnourished will be treated with nutritional intervention with enhancing dietary practice and nutritional supplementation.

Data Availability: Data can be made available upon request.

Ethical Approval: Ethical approval was obtained from the Institutional Review Committee of Pokhara University.

Consent: The participants were informed about the objectives of the study and that participation would be voluntary. Confidentiality was maintained, while written consent was taken from each respondent prior to data collection.

Conflicts of Interest:

The authors declare that they have no conflicts of interest.

Authors' Contributions:

DD and DKY designed the study, developed the tools and performed the analytical analysis. Field work was carried out by DD, BB, MK and ARP. DD and ARP performed the statistical analysis and interpretation of the data. Final report was written by DD, ARP and MK. Manuscript draft was prepared, and it was reviewed by ARP, DD, DKY, MK and BB.

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